

ABSTRACT

A monolithically integrated, electromechanical microwave switch, capable of handling signals from DC to millimeter-wave frequencies, and an integrated electromechanical tunable capacitor are described. Both electromechanical devices include movable beams actuated either by thermo-mechanical or by electrostatic forces. The devices are fabricated directly on finished silicon-based integrated circuit wafers, such as CMOS, BiCMOS or bipolar wafers. The movable beams are formed by selectively removing the supporting silicon underneath the thin films available in a silicon-based integrated circuit technology, which incorporates at least one polysilicon layer and two metallization layers. A cavity and a thick, low-loss metallization are used to form an electrode above the movable beam. A thick mechanical support layer is formed on regions where the cavity is located, or substrate is bulk-micro-machined, *i.e.*, etched.